**Wind Integration Forum - Oversupply Technical Oversight Committee**

**Wednesday, August 31, 2011**

**Attendees:** John Apperson (PacifiCorp), Nancy Baker (PPC), Ty Bettis (PGE), Geoff Carr (NRU), Gillian Charles (NWPCC), Kurt Conger (Seattle), Ken Dragoon (NWPCC), Gordon Dobson-Mack (PowerEx), Don Faulkner (COE-NWD), Gerry Froese (Iberdrola), Jimmy Lindsay (RNP), Trace Megenbier (ODOE), Kevin Nordt (Grant PUD), Tess Park (Idaho Power), Rob Petty (BPA), Howard Schwartz (NWPCC/WA UTC), Henry Tilghman (EDPR), Cameron Yourkowski (RNP)

**Grouping of Ideas into Categories w/ Leads (lead in bold)**

1. **Generation Displacement** – voltage support, load following, thermal, hydro, co-gens, etc. What can be done, what would it cost? (**Kevin Nordt**, John Apperson, Jimmy Lindsay, Ty Bettis, Tess Park, Rob Petty, Nancy Baker)
* Add steam bypass to cogeneration turbines. Forgive demand charge when bypassing own production.
* Turn PV panels off
* Allow thermal units to come offline – financial arrangement
	+ Economically feasible?
	+ On/off spread
	+ How much will it cost to get remaining thermal offline?
	+ Which projects were on last spring? Cost?
* Cycling a coal unit – need large capital investment
	+ Cycle daily? Minimum down time. Ability to follow load?
* Mechanism to incent thermal units to not be subject to extreme high prices over heavy load hours.
	+ Coal plants made more money in daytime markets than lost at night, effectively resulting in a substantial negative variable cost to shutting them down.
* Flexibility of coal units – reducing minimum generation levels.
1. **Market Mechanisms** – communication to retail market (**Ken Dragoon**, Trace Megenbier, Howard Schwartz, Gordon Dobson-Mack, Henry Tilghman)
	1. Moving load into light load hours
	2. Creating load, developing markets, economic development
* Resistive load banks – compensate individuals to take generation off or increase load.
* Operate water heaters more intelligently. Move water heater loads to the night? 4 million electric water heaters in the NW.
* Chilled water storage – a/c during the day, invest in chilled water storage, move load into night.
* Using localized hydrogen production (electrolysis) with storage and fuel cells for later generation.
* Capture synergies with the rollout of electric vehicle charges. Charging focused on periods of oversupply.
	+ Denmark – batteries get replaced, old batteries at filling stations connected to the grid to provide balancing and light load hour demand.
* Aluminum plants – incentive to keep them online?
* Special rates for certain industrial processes & server farms using more energy than they did in previous year. (ex. Alcoa?)
* All utilities get together w/ BPA and prepare for on-call “festival of natural abundance.” Have people on call to simply use more power, e.g. office buildings turn on lights.
	+ “Energy inefficiency programs”
* Recharging underground reservoirs
* Compressed air energy storage
* Irrigators to pump water during light load hours
* Municipal water pumping stations
1. **Hydro System** (**Geoff Carr**, Don Faulkner, Cameron Yourkowski, Rob Petty, Kevin Nordt,)
* Feather the hydro turbines
	+ Unloaded hydro - Spinning reserve
	+ Technically feasible to pull turbines out?
	+ Put mechanical brakes on the turbines?
	+ Add bearing protection for overspeed - capital investment
* Operate the locks or use as stilling basins
* Reduce efficiency of the generation going thru turbines by lowering the head (e.e. John Day)
	+ Reduce surface area of the pond by considerable amount – might have fish benefits (transit time) and might also cool the water and address dissolved gas level
* Additional coordination or transparency of operations to plan ahead for spill over dams
* Spillway modifications – investment to pass water at very low or no TDG
* Reduced TDG at given spill levels- Selective withdrawal to cool water – cover reservoirs
* Shared hydro under drought conditions – what about oversupply conditions? Mid-C spill sharing agreement? More widely shared and coordinated spilling of energy.
* Incentivize greater storage in Canada. Columbia River Treaty.
	+ Non-treaty storage – how does that impact this issue?
* ROR hydro projects that could have been spilling but weren’t
	+ Economic question – what is your price point for spill vs. other best opportunities
* Flood control – Increase river level without causing flooding in Portland/Vancouver
	+ Move water downriver quickly – duration of event shorter
	+ Higher flow level during daytime, increased TDG levels?
* Keys Pumping Station
* Increase storage at existing hydro facilities (e.g., Chief Joseph)
1. **Transmission** (**Tess Park**, John Apperson, Cameron Yourkowski, Gordon Dobson-Mack, Nancy Baker)
	1. Usage
	2. Expansion
* 700 MW DC line upgrade to S. CA
* More transparency in real-time by transmission providers on unused transmission capability
* Voltage support in areas w/ must-run thermal plants
	+ The group could not identify an instance where thermal plant was operated to provide voltage support.
* Improved coordination between entire NW region and BC systems?
* Encourage more diverse wind project additions
* De-optimize to increase transmission losses
1. **Wholesale Market Mechanisms** (**Ty Bettis**/**John Apperson**, Jimmy Lindsay, Henry Tilghman)
	1. Better intelligence and communication/merchant alert mechanisms
	2. Energy imbalance market
* Forgive loss return for transmission customers – selling zero price energy back to entities.
* Sell into a negative price markets.
	+ Embrace negative prices, let market respond on economic basis.
* Mechanism to contract wind projects to provide inc reserves – dec reserves too?
* Improved coordination between entire NW region and BC systems?
* Energy imbalance market
* Legislative policy to move load, e.g. Merchant Alert Protocol
	+ Improved intelligence and communication about market
* Encourage baseload renewable resources
	+ Resources with output more coincident with load (e.g., solar, hydro)
* Encourage more diverse wind project additions